## REMARKS

### I. Introduction

By the present Amendment, claims 1 and 10 have been amended. No claims have been added or cancelled. Accordingly, claims 1-10 remain pending for examination. Claims 1 and 10 are independent.

### II. Office Action Summary

In the Office Action of December 8, 2010, claims 1 and 10 were objected to because of various informalities. Claims 1-3, 5 and 10 were rejected under 35 USC §102(e) as being anticipated by U.S. Patent No. 7,274,363 issued to Ishizuka et al. ("Ishizuka"). Claim 4 was rejected under 35 USC §103(a) as being unpatentable over Ishizuka in view of U.S. Patent Application No. 2002/0030647 to Hack et al. ("Hack). Claims 6 and 7 were rejected under 35 USC §103(a) as being unpatentable over Ishizuka in view of U.S. Patent No. 6,518,962 issued to Kimura et al. ("Kimura"). Claims 8 and 9 were rejected under 35 USC §103(a) as being unpatentable over Ishizuka in view of U.S. Patent No. 6,414,443 issued to Tsuruoka et al. ("Tsuruoka"). These rejections are respectfully traversed.

### III. Claim Objections

Claims 1 and 10 were objected to because of various informalities. Regarding these objections, the Office Action indicates that claims 1 and 10 each recite the limitation "state of the number of pixels", although there is no previous discussion of a number of pixels. The Office Action suggested that "the number of pixels" be replaced with --the plurality of pixels--, which exists throughout the claims.

By the present Amendment, Applicants have revised the claims, and deleted the portion containing the objectionable language, thereby rendering this particular ground of rejection moot.

## IV. Rejections under §102

Claims 1-3, 5, and 10 were rejected under 35 USC §102(e) as being anticipated by Ishizuka. Regarding this rejection, the Office Action alleges that Ishizuka discloses a display apparatus that includes a pixel array including a plurality of pixels that each includes a light emitting unit, a drive element, and a switching element. The display apparatus is further indicated as disclosing a data signal drive circuit for receiving the image data for each frame period and outputting the image signal to the pixel array, a scanning signal drive circuit for outputting a scanning signal to the pixel array, and a current source for outputting the current supplied to the light emitting unit. Additionally, the Office Action indicates that the current source modulates the value or the amount of current being output. Applicants respectfully disagree.

By the present Amendment, Applicants have revised the claims to better clarify the invention with respect to features that are not disclosed by the cited reference. As amended, independent claim 1 defines a display apparatus that comprises:

> a pixel array including a plurality of pixels, each pixel including:
>
> a light emitting unit, a drive element for controlling supply of a current to said light emitting unit, and
>
> a switching element for controlling said drive element according to an image signal;
>
> a data signal drive circuit for receiving image data for each frame period and outputting said image signal to said pixel array based

on said image data, said each frame period being provided for displaying one screen of said image data;

a scanning signal drive circuit for outputting a scanning signal to said pixel array, said scanning signal being for controlling a timing at which said switching element receives said image signal;

a current source for, through said drive element, outputting said current supplied to said light emitting unit; and

a control circuit for increasing a voltage applied to said light emitting unit while pixels with small gray scale numbers are emitting no light and pixels with large gray scale numbers are emitting light within said each frame period.

The display apparatus of independent claim 1 includes a pixel array, a data signal drive circuit, a scanning signal drive circuit, a current source, and a control circuit. The pixel array includes a plurality of pixels that each includes a light emitting unit, a drive element for controlling the current supplied to the light emitting unit, and a switching element to control the drive element according to an image signal. The data signal drive circuit receives image data for each frame period and outputs the image signal to the pixel array based on the image data, with each frame period being provided for displaying one screen of the image data. The scanning signal drive circuit outputs a scanning signal to the pixel array for controlling the timing at which the switching element receives the image signal. The current source outputs the current supplied to the light emitting unit through the drive element. The control circuit increases the voltage applied to the light emitting unit while pixels having small gray scale numbers are not emitting any light and pixels with large gray scale numbers are emitting light during each frame period.

As discussed in the Specification, a blanking interval can be provided during which all pixels (from those with lowest gray scale value to highest gray scale value) do not emit any light. See paragraphs [0085] and [0086] of the Published

Application, and Fig. 19. The display synchronous cathode potential control circuit 27 reduces the cathode side potential of the organic EL elements 24, thereby increasing the voltage between both electrodes of each organic EL element 24 according to the display phase signal 63. This is done while the pixels with small gray scale numbers are emitting no light and the pixels with large gray scale numbers are emitting light in order to cause only the pixels with high gray scale values to emit light at a high luminance level. According to such an arrangement, it is possible to enhance the peak luminance as well as the visual impact of the display screen.

The Office Action alleges that Ishizuka discloses all of the features recited in independent claim 1. As Applicants have previously indicated, Ishizuka discloses a display panel driving device wherein the value of the light emission drive current flowing to each pixel element emits light in succession is measured. The luminance is subsequently corrected for each input pixel data based on the light-emission drive current values. According to Ishizuka, current from the power supply circuit is supplied via a switch when the switch is turned on or via resistor when the switch is turned off. See column 18, lines 34 to 45. A controller is used to control the on-off state of the switch, and the current measuring circuit outputs a voltage that corresponds to the value of the current flowing through the resistor. The controller further executes a leak current canceling routine that measures the current flowing in the display panel when the light-emission drive is ceased in all of the pixel positions. The timing for executing these routines is provided when the power supply of the display apparatus is turned off, when the image data is not being input, or during intervals between one subfield and the next subfield.

In response to Applicants' previously submitted, the Office Action indicates that Ishizuka discloses a drive current measuring routine and a drive voltage setting routine, and that a voltage control is applied by altering the amount of current supplied according to aging and temperature changes in the pixels. The leak current cancellation routines are also indicated as modulating the amount or value of current according to a change in light emission state of the number of pixels. The Office Action further indicates that the leak current will directly effect a change in light emission state of the pixels such that the more current which leaks, the lower the luminance of the light emission of the pixels.

Irrespective of the contentions made in the Office Action, Ishizuka does not appear to control the amount of voltage applied to the light emitting unit in the same manner as the claimed invention. Although Ishizuka performs leak current cancellation routines, luminance correction is performed to the pixel data such that the light-emission period within one frame is shorter for the pixel portion having an EL element with a large driving current, than the EL element with a small driving current. See column 23, lines 19-30. Although the luminance of light emitted by the EL element having a larger driving current becomes large, the apparent luminance of the EL element in the screen is made uniform by shortening the light-emission period within one frame by the pixel data PD corresponding to the EL element having a large driving current to a degree coping with the increase in luminance. Thus, Ishizuka appears to modify the light emission period and does not control the voltage within the same period. Consequently, Ishizuka fails to disclose features now recited in independent claim 1, such as:

> a control circuit for increasing a voltage applied to said light emitting unit while pixels with small gray scale numbers are emitting no

light and pixels with large gray scale numbers are emitting light within said each frame period.

It is therefore respectfully submitted that independent claim 1 is allowable over the art of record.

Claims 2 to 9 depend from independent claim 1, and are therefore believed allowable for at least the reasons set forth above with respect to independent claim 1. In addition, these claims each introduce novel elements that independently render them patentable over the art of record.

Independent claim 10 defines a method for displaying an image based on image data by using a pixel array that includes a plurality of pixels. Each of the pixels includes a light emitting unit, a drive element for controlling the supply of current to the light emitting unit, and a switching element for controlling the drive element according to an image signal. The method comprises the steps of:

a light emitting unit;

a drive element for controlling supply of a current to said light emitting unit; and

a switching element for controlling said drive element according to an image signal;

wherein said method comprises the steps of:

outputting said current from a current source to said light emitting unit through said drive element;

receiving said image data for each frame period and outputting said image signal from a data signal drive circuit to said pixel array based on said image data, said each frame period being provided for displaying one screen of said image data;

outputting a scanning signal from a scanning signal drive circuit to said pixel array, said scanning signal being for controlling a timing at which said switching element receives said image signal; and

increasing a voltage applied to said light emitting unit while pixels with small gray scale numbers are emitting no light and pixels with large gray scale numbers are emitting light within said each frame period.

As can be appreciated, the method of independent claim 10 recites various steps that correspond somewhat to the features recited an independent claim 1. In particular, the method of independent claim 10 now Includes a step of increasing a voltage applied to the light emitting unit while pixels with small gray scale numbers are emitting no light and pixels with large gray scale numbers are emitting light within each frame period. As previously discussed, such features are not shown or suggested by the art of record.

It is therefore respectfully submitted that independent claim 10 is allowable over the art of record.

## V. Conclusion

For the reasons stated above, it is respectfully submitted that all of the pending claims are now in condition for allowance. Therefore, the issuance of a Notice of Allowance is believed in order, and courteously solicited.

If the Examiner believes that there are any matters which can be resolved by way of either a personal or telephone interview, the Examiner is invited to contact Applicants' undersigned attorney at the number indicated below.

## AUTHORIZATION

Applicants request any shortage or excess in fees in connection with the filing of this paper, including extension of time fees, and for which no other form of payment is offered, be charged or credited to Deposit Account No. 01-2135 (Case: 1497.43143X00).

Respectfully submitted,
ANTONELLI, TERRY, STOUT & KRAUS, LLP.

/Leonid D. Thenor/
Leonid D. Thenor
Registration No. 39,397

LDT/vvr
1300 N. Seventeenth Street
Suite 1800
Arlington, Virginia 22209
Tel: 703-312-6600
Fax: 703-312-6666

Dated: March 8, 2011